

REMARKS

In response to the Office Action mailed June 3, 2003, Applicants propose to amend their application and request reconsideration in view of the proposed amendment and following remarks. It is proposed to cancel claim 20 and to add claim 25 in this Amendment. Therefore, upon entry of the Amendment, claims 10, 11, 17-19, and 21-25 will be pending.

Claim 11 was rejected as anticipated by Hinkle et al. (U.S. Patent 6,072,228, hereinafter Hinkle). This rejection is respectfully traversed.

It appears that Hinkle has been misinterpreted or, alternatively, the claims in relation to Hinkle have been misunderstood.

As a first matter, Hinkle does not describe a sealed semiconductor device and therefore is not particularly pertinent to the invention as defined by claim 11.

Second, among the important limitations of claim 11 is the arrangement of the die pad separate from and not connected to the lead frame. Quite the contrary situation is present in Hinkle, as shown, for example, in each of Hinkle's Figures 7a-7c. It is apparent that the die pad 36 is connected at the attachment tabs 42 to the lead frame. The quotation of the claim language at page 3, lines 1 and 2 of the Official Action suggest the Examiner has not given proper interpretation to the claim language as to this point. In characterizing Hinkle, the Examiner stated that the die pad 36 "is separated from and not connected to the lead frame (such as frame portions 50 and 56)". What claim 11 states is that the die pad is separate from and not connected to the lead frame. The claim does not state, as the interpreted by the Examiner, that the die pad is separate from and not connect to **at least some portions of** the lead frame. When the proper interpretation is given to the unambiguous language of claim 11, then it is apparent that the rejection is erroneous and cannot be properly maintained.

Third, claim 11 also specifies that some of the fixed protrusions contact some of the internal leads. The Official Action at page 3, lines 2 and 3, in characterizing Hinkle, states that Hinkle shows "fixed protrusions (38) extending toward and contacting and connected to the internal leads (58)". Claim 11 only states that the fixed protrusions contact, not that that the fixed protrusions are connected to, internal leads. Again, it appears that limitations have been read into the claims that are not present there.

Further, the only contact **or** connection illustrated in the figures of Hinkle cited by the Examiner concerns the hanging leads 38 which suspend and support the die pad 36. Those hanging leads 38 cannot properly be considered "fixed protrusions" extending from the die pad. Moreover, it is apparent from inspecting, for example, Figure 7b of Hinkle, that the hanging leads 38 do not contact any internal leads of the lead frame. The internal leads in the Hinkle lead frame are elements 54a, not the elements 58 cited by the Examiner. Element 58

in Hinkle's figures is an attachment to a receiving portion and has nothing to do with an internal lead. For this additional reason, the rejection of claim 11 as anticipated by Hinkle is erroneous and must be withdrawn.

In this Amendment claim 25 is added, depending from claim 11. That newly added claim explains that the protrusions prevent the internal leads from contacting the semiconductor chip. This claim is supported by the description appearing at page 17 of the patent application beginning in line 7. As explained there, the fixed protrusions support the internal leads so that they are not displaced by the flow of a molten resin in the course of encapsulating the semiconductor chip, the die pad, and other elements contained within an encapsulating resin. Claim 25 is patentable because claim 11, from which claim 25 depends, is patentable and because Hinkle does not disclose anything like the supporting fixed protrusions nor provide any other structure for preventing displacement of the internal leads in the course of resin encapsulation.

Claim 10 and its dependent claims 17 and 19 were rejected as unpatentable over Takahashi et al. (U.S. Patent 5, 198,883, hereinafter Takahashi). This rejection is respectfully traversed.

In this Amendment it is proposed to amend claim 10 by further describing that the internal lead that extends substantially perpendicular to and contacts the die pad is not bonded to the die pad. Examples of embodiments of the invention within the scope of amended claim 10 are illustrated in cross-sectional views in Figures 22 and 24. The contact of the internal lead without connection to the die pad is described in the patent application at pages 15 and 16.

In applying Takahashi in rejecting claim 10, the Examiner directed attention to Figures 1A-1E. As shown in Figures 1C-1E and as described by Takahashi, the die pad 13 is removed from the lead frame by severing at the line B-B' and subsequently welded to the projecting portions 23 of the lead frame. In making the rejection, the Examiner erroneously compared the at least one internal lead of the final paragraph of claim 10 with the projecting portions 23 of Takahashi.

The rejection is erroneous because claim 10 specifies that the die pad is separate from and not connected to the lead frame. Clearly, after the welding of the die pad 13 in Takahashi to the lead frame 20 at the portions 23, there is a direct connection. Moreover, there is no suggestion for the absence of a connection in Takahashi because, otherwise, there would be no support for the die pad 13. Finally, in amended claim 10, it is expressly stated that there is no bonding between the die pad and the internal lead that contacts the die pad. If, for the sake of argument, the portions 23 are considered to be internal leads, which they are not, then it is apparent that they are bonded, i.e., welded, to the die pad 13 and therefore cannot meet

nor suggest the structure of claim 10. Upon reconsideration, the rejection should be withdrawn. Upon withdrawal of that rejection, the rejections of claims 17 and 19, claims that depend from claim 10, should also be withdrawn.

Claim 18, which also depends from claim 10, was rejected as unpatentable over Takahashi in view of Aoki (U.S. Patent 5,834,691). This rejection is respectfully traversed.

Aoki was cited as allegedly showing the limitation of claim 19, but not the limitations of claim 10 from which claim 19 depends. Assuming, solely for the sake of argument, that the limitation of claim 19 is described by Aoki, the combination of Takahashi and Aoki can still not meet the limitations of claim 10 for the reasons already described with regard to the rejection of claim 10. Therefore, the rejection of claim 18 should be withdrawn for the same reasons that the rejection of claim 10 should be withdrawn.

In the foregoing amendment, dependent claim 20 is re-written in independent form as amended claim 21. The limitation of claim 20 is also added to independent claim 22. Claims 21 and 22 are quite similar although claim 21 encompasses a sealed semiconductor device whereas claim 22 is directed to only part of the sealed semiconductor device. In view of the amendment of claim 22, some minor amendment is required in claim 24 so that the form of the language used in the claims is consistent. As explained in previous responses, claims 21 and 22 pertain to embodiments of the invention illustrated Figures 1 and 2 of the patent application.

Claims 20-24, now claims 21-24, were rejected as unpatentable over Murakami et al. (U.S. Patent 5,612,569, hereinafter Murakami) in view of Lee (U.S. Patent 5,358,906). This rejection is respectfully traversed.

In citing Murakami, the Examiner acknowledged that Murakami fails to teach all of the limitations in claims 21-24 concerning the tape members. The Examiner relied upon Lee for tape members extending beyond the edge of the semiconductor chip. However, Applicants submit that Lee the combination of Murakami and Lee does not suggest any of claims 21-24.

As an initial point, the structure described by Murakami does not include a die pad. Instead, a tape member is attached to a semiconductor chip to support inner leads and to insulate those inner leads of a lead frame from the semiconductor chip. Therefore, the tape member must be adhered to both of the surfaces to which it is exposed, i.e., the semiconductor chip and the internal leads.

In Lee, as shown in Figure 5, the insulating layer 53 has poor adhesion properties. In order to improve those properties, the insulating layer 53 is made rough, i.e., knurled, to improve the adhesion between the insulating layer 53 and the internal lead, and between the insulating layer 53 and the semiconductor chip 51. Thus, Lee teaches that, like the Murakami

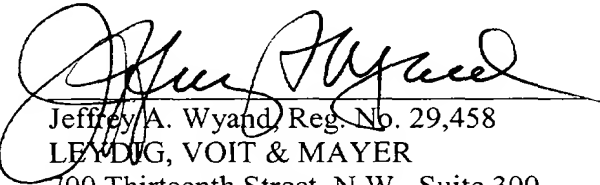
arrangement, the insulating layer should not merely be in contact with the semiconductor chip 51 and the inner lead, but bonded to both of them.

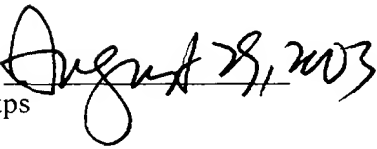
Therefore, although Lee, unlike Murakami discloses tape members that protrude beyond the semiconductor chip, Lee does not describe that the insulating layer, i.e., tape members, and the semiconductor chip should merely be in contact with each other and not bonded to each other. In other words, even at the protruding parts of the tape members of Lee were added to Murakami, there would still be no suggestion for any of claims 21-24 in which the tape member merely contacts but is not adhered to the surface of the semiconductor chip. Therefore, upon reconsideration, the rejection of claims 20-24, now claims 21-24 should be withdrawn.

In the foregoing amendment no more claims are added than the number of finally rejected claims that are cancelled. Claims are combined and limitations are added to two claims that are apparent from the examined claims. Accordingly, no new issues are raised by the amendment and, in the event of an appeal, simplifies the issues. For these reasons, the amendment should be entered even if the Examiner maintains the rejection.

Prompt and allowance of the remaining claims is earnestly solicited.

Respectfully submitted,


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